SUBSTITUTE FORM PTO-1390 U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER
12406-014001

U.S. APPLICATION NO. (If Known, see 37 CFR 1.5)
09/786832

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/SG 99/00074	9 July 1999 (09/07/99)	9 July 1999

TITLE OF INVENTION
MECHANICAL PATTERNING OF A DEVICE LAYER

APPLICANT(S) FOR DO/EO/US
Ewald Karl Michael Guenther, Zhong Chen and Brian Cotterell

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☐ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☒ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern other documents or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
    ☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☐ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
    ☒ International Search Report
    ☒ Return Postcard
    ☐
    ☐
    ☐

CERTIFICATE OF MAILING BY EXPRESS MAIL

Express Mail Label No EL 282 427 120 US

March 9, 2001
Date of Deposit

U.S. APPLICATION NO. (IF KNOWN) 09/786832	INTERNATIONAL APPLICATION NO. PCT/SG 99/00074	ATTORNEY'S DOCKET NUMBER 12406-014001

17. ☒ The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)- (5)):

	CALCULATIONS PTO USE ONLY	
Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1000**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$860**		
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO..... **$710**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)..... **$690**		
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)..... **$100**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0.00	

Claims	Number Filed	Number Extra	Rate		
Total Claims	61 - 20 =	41	x **$18**	$738.00	
Independent Claims	2 - 3 =	0	x **$80**	$0.00	
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)			+ **$270**	$0.00	
TOTAL OF ABOVE CALCULATIONS =				$1598.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				$0.00	
SUBTOTAL =				$1598.00	
Processing fee of **$130** for furnishing the English Translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f))				$0.00	
TOTAL NATIONAL FEE =				$1598.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +				$0.00	
TOTAL FEES ENCLOSED =				$1598.00	
				Amount to be refunded:	$
				Charged:	$

a. ☒ A check in the amount of $1598.00 to cover the above fees is enclosed.
b. ☐ Please charge my Deposit Account No. 06-1050 in the amount of $0.00 to cover the above fees. A duplicate copy of this sheet is enclosed.
c. ☒ The Commissioner is hereby authorized to charge any additional fees, which may be required, or credit any overpayment to Deposit Account No. 06-1050. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b) must be filed and granted to restore the application to pending status.

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MECHANICAL PATTERNING OF A DEVICE LAYER

Field of the Invention

The present invention relates to the fabrication of devices. More particularly, the invention relates to patterning of a device layer on a substrate.

Background of the Invention

In device fabrication, one or more device layers are formed on a substrate. The layers are sequentially deposited and patterned to create features on the surface of the substrate. The layers can be patterned individually and/or as a combination of layers to form the desired features. The features serve as components that perform the desired functions, creating the device.

One type of device which is of particular interest is a light emitting diode (LED). Typically, an LED cell or pixel comprises one or more functional layers sandwiched between two electrodes to form a functional stack. Charge carriers are injected from both electrodes. These charge carriers recombine in the functional layer or layers, causing visible radiation to emit. Recently, significant advances have been made utilizing organic functional layers to form organic LEDs

(OLEDs). Such devices are fabricated on rigid glass substrates having a thickness of about 0.3-1.1 mm.

Typically, OLED devices comprises a plurality of OLED pixels arranged to form a display, such as a flat panel display (FPD). A pixelated OLED device includes, for example, a plurality of first electrode strips formed on the substrate. The strips are arranged in a first direction. One of more organic layers are formed on the first electrodes strips. A plurality of second electrode strips is formed over the organic layers in a second direction. Typically, the first and second electrode strips are orthogonal to each other. The intersections of the first and second electrode strips form LED pixels.

The first electrode strips are created on the substrate by patterning an electrode layer. Conventionally, the electrode layer is patterned by photolithographic and etch processes. For example, a photosensitive resist layer is deposited on the electrode. The resist layer is exposed with radiation having the desired pattern defined by a mask. After development, unwanted resist is removed to expose portions of the electrode beneath. The exposed portions are removed by a wet etch, leaving the desired pattern

on the electrode layer. Thus, conventional techniques for patterning the electrode require numerous steps, increasing raw process time and manufacturing cost.

As evidenced by the above discussion, it is desirable to provide a simplified process of patterning a device layer.

Summary of the Invention

The invention relates to patterning a device layer on a substrate during device fabrication. In accordance with the invention, the patterning of the device layer is achieved using a stamp with a pattern thereon. The pattern is formed by protrusions having a height greater than the thickness of the device layer to pattern the device layer. The stamp is pressed against the surface of the substrate under a load which patterns the device layer. The load is selected to precisely control cracking the edges of the patterned areas but without cracking the non-patterned areas.

Brief Description of the Drawings

Fig. 1 shows an organic pixel LED;

Figs. 2-4 show a process for patterning a device layer in accordance with one embodiment of the invention; and

Fig. 5 shows an alternative process for patterning a device layer.

Preferred Embodiments of the Invention

The invention relates generally to the fabrication of devices. In particular, the invention describes a process for patterning a device layer on a substrate, particularly a device layer formed on a ductile or flexible substrate. Various types of devices can be formed by the present invention. For example, electrical, mechanical, or electromechanical devices can be formed. Also, the invention can be useful in fabricating a microelectromechanical system (MEMS). In one embodiment, a process for forming a pixelated organic LED device is provided.

Fig. 1 shows a cross-section of an OLED pixel. As shown, a substrate 101 is provided. The substrate provides support for the LED pixel. A functional stack 105 comprising of one or more organic functional layers 120 formed between conductive layers 110 and 150 is formed on the substrate, creating the LED pixel. The

conductive layer 110 serves as an anode and the conductive layer 150 serves as a cathode.

A plurality of LED pixels can be arranged on the substrate to form an FPD. The FPD is used in various consumer electronic products, including cellular phones, cellular smart phones, personal organizers, pagers, advertising panel, touch screen displays, teleconferencing equipment, multimedia equipment, virtual reality products, and display kiosks.

Figs. 2-5 show a process for patterning a device layer on a substrate in the fabrication of a device. In one embodiment, the device fabricated comprises a pixelated OLED device. Forming other types of devices such as electrical and/or mechanical devices, including sensor arrays, is also useful.

Referring to Fig. 2, a substrate 201 is provided on which the active components of the device are formed. The substrate comprises a plastic or a polymeric material. In one embodiment, the substrate comprises a flexible substrate, such as poly(ethylene terephthalate) (PET) or polyester for forming flexible devices. The substrate can comprise a transparent substrate to serve as, for example, a display surface for an OLED display. The use of a flexible transparent substrate for forming

a flexible display is also useful. Various types of plastic substrates, such as PET, poly(butylene terephthalate) (PBT), poly(enthylene naphthalate) (PEN), Polycarbonate (PC), polyimides (PI), polysulfones (PSO), and poly(*p*-phenylene ether sulfone) (PES) are useful. Other substrates comprising polyethylene (PE), polypropylene (PP), poly(vinyl chloride) (PVC), polystyrene (PS) and poly(methyl methyleacrylate) (PMMA), can also be used.

In one embodiment, the substrate should be thin to result in a thin device while providing sufficient mechanical integrity during the fabrication process to support the active components. Preferably, the substrate should be as thin as possible while providing sufficient mechanical integrity during the fabrication process. The substrate thickness is, for example, about 20 - 200 um. Thicker substrates are also useful. For example, thicker substrate, can be used where device thickness or flexibility is not an issue.

A device layer 210 is formed on the substrate. The device layer comprises, for example, a conductive layer. Other types of device layers, such as dielectrics or semiconductors, are also useful. In one embodiment the device layer comprises a transparent

conductive layer that serves as an electrode for an LED device. The transparent conductive layer comprises an indium-tin-oxide (ITO). ITO is useful in forming the transparent anode of the LED device. Other transparent conductive layers, including zinc-oxide or indium-zinc-oxide are also useful. Various techniques, such as sputtering, physical vapor deposition (PVD), chemical vapor deposition (CVD) or plasma enhanced CVD (PECVD) can be employed to form the device layer. The device layer is deposited on the substrate to a thickness of about, for example, 100 nm. The thickness, of course, can vary depending on design requirements.

A stamp 280 comprising a desired pattern on a surface 231 is provided. The pattern is define by protrusions 285 on surface 231. The stamp is made of a hard material such as steel, silicon, or ceramic. Other materials that are sufficiently hard can also be used to form the stamp.

In one embodiment, the pattern is deeper than the thickness of the device layer. This ensures proper patterning of the device layer. However, the height of the protrusions should be less than that which would compromise the support function of the substrate. In one embodiment, the height of the protrusions is at

least about 2 - 10 times the thickness of the device layer, preferably 5 - 10 times the thickness of the device layer. For example, the height of the protrusions is about 0.5 - 1 μm for a 100 mm thick device layer. The height of the protrusions can be optimized according to the mechanical properties and thickness of the substrate.

Referring to Fig. 3, a load is applied on the stamp 280, forcing the stamp against the substrate 201. This causes the pattern on the stamp to be transferred to the substrate. The load applied on the stamp is sufficient to prevent the device layer 210 from cracking in the active or non-patterned areas as it is patterned. In one embodiment, the net pressure of the load is about 200 - 400 MPa for a typical polymer substrate. In general, the required net pressure should exceed about 1.1 times the yield strength of the substrate material.

Referring to Fig. 4, the stamp is lifted from the substrate. As shown, the pattern on the stamp is transferred onto the device layer. In one embodiment, the device layer is patterned to form electrode strips on the substrate. Conventional processing continues to form the device.

In one embodiment, the process continues to fabricate OLED pixels of an OLED device. Fabrication of OLED pixels is described in, for example, United States Patent 4,720,432 and Burroughes et. al, Nature 347 (1990) 539, which are herein incorporated by reference for all purposes. This includes, for example, depositing one or more organic functional layers, such as conjugated polymer or Alq_3, on the electrode. Other types of organic layers can also be useful. Preferably, a plurality of functional layers is formed on the electrode. Second electrode strips comprising metal such as aluminum or other conductive material are formed over the functional layer. The second electrode strips are typically orthogonal to the bottom electrode strips. Providing second electrode strips that are diagonal to the bottom electrode strips is also useful. The intersections of the top and bottom electrode strips form OLED pixels. Various techniques can be used to form the electrode strips. For example, the second electrode strips can be formed by selective deposition techniques. Alternatively, the electrode strip can be formed by selectively patterning a top electrode layer to form the strips.

In an alternative embodiment, the pattern on the stamp can be formed to include a plurality of devices for parallel processing, thereby decreasing process time per device. The stamp pattern can be formed by a variety of techniques. Such techniques include, for example, grinding or photolithographic and etch processes.

Fig. 5 shows another embodiment of the invention. As shown, a stamp comprising a drum 580 with the desired pattern 585 thereon is provided. The drum stamp is used in reel-to-reel processing. A long flexible substrate 501 with a device layer 510 formed thereon is provided. The substrate is translated through the drum while it is pressed under rotation, patterning the device layer. As shown, the substrate is translated in a direction from right to left and the drum stamp is rotated in the clockwise direction. Reversing the direction that the substrate is translated is also useful. Reel-to-reel processing enables parallel processing of devices.

While the invention has been particularly shown and described with reference to various embodiments, it will be recognized by those skilled in the art that modifications and changes may be made to the present invention without departing from the spirit and scope

thereof. The scope of the invention should therefore be determined not with reference to the above description but with reference to the appended claims along with their full scope of equivalents.

What is claimed is:

1. In the fabrication of a device, a method of patterning a device layer comprising:

providing a substrate comprising the device layer on its surface; and

patterning the device layer by pressing a stamp comprising a pattern against the substrate.

2. The method of claim 1 wherein the device comprises an organic LED device.

3. The method of claim 2 wherein the substrate comprises a polymeric substrate.

4. The method of claim 3 wherein the substrate comprises a flexible or ductile substrate.

5. The method of claim 4 wherein the substrate comprises a transparent substrate.

6. The method of claim 5 wherein the device layer comprises a transparent conductive layer.

7. The method of claim 6 wherein the transparent conductive layer comprises a conductive oxide.

8. The method of claim wherein 7 conductive oxide comprises indium-tin-oxide.

9. The method of claim 8 wherein the pattern is produced by protrusions on a surface of the stamp.

10. The method of claim 9 wherein patterning the device layer forms lower electrodes on the substrate.

11. The method of claim 10 wherein the protrusions comprise a height greater than a thickness of the device layer.

12. The method of claim 11 wherein the height of the protrusions is at least about 2 - 10 times greater than the thickness of the device layer.

13. The method of claim 12 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

14. The method of claim 13 wherein the load comprises a net pressure of greater than about 1.10 times a yield strength of the substrate.

15. The method of claim 14 further comprises processing to form OLED pixels.

16. The method of claim 15 wherein the processing to form OLED pixels comprises:

forming at least one organic functional layer on lower electrodes; and

forming upper electrodes on the organic functional layer, wherein OLED pixels are formed where upper and lower electrodes sandwich the organic functional layer.

17. The method of claim 3 wherein the substrate comprises a transparent substrate.

18. The method of claim 17 wherein the device layer comprises a transparent conductive layer.

19. The method of claim 18 wherein the pattern is produced by protrusions on a surface of the stamp.

20. The method of claim 19 wherein patterning the device layer forms lower electrodes on the substrate.

21. The method of claim 20 wherein the protrusions comprise a height greater than a thickness of the device layer.

22. The method of claim 21 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

23. The method of claim 22 further comprises processing to form OLED pixels.

24. The method of claim 23 wherein the processing to form OLED pixels comprises:

forming at least one organic functional layer on lower electrodes; and

forming upper electrodes on the organic functional layer, wherein OLED pixels are formed where upper and lower electrodes sandwich the organic functional layer.

25. The method of claim 3 wherein the device layer comprises a conductive layer.

26. The method of claim 25 wherein the pattern is produced by protrusions on a surface of the stamp.

27. The method of claim 26 wherein patterning the device layer forms lower electrodes on the substrate.

28. The method of claim 27 wherein the protrusions comprise a height greater than a thickness of the device layer.

29. The method of claim 28 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

30. The method of claim 29 further comprises processing to form OLED pixels.

31. The method of claim 30 wherein the processing to form OLED pixels comprises:

forming at least one organic functional layer on lower electrodes; and

forming upper electrodes on the organic functional layer, wherein OLED pixels are formed where upper and lower electrodes sandwich the organic functional layer.

32. The method of claim 2 wherein the substrate comprises a material selected from the group consisting of polyester, poly(ethylene terephthalate), poly(butylene terephthalate), poly(enthylene naphthalate), polyethylenesterephtalate, polycarbonate, polyimides, polysulfones, poly(*p*-phenylene ether sulfone), polyethylene, polypropylene, poly(vinyl chloride), polystyrene, and poly(methyl methyleacrylate).

33. The method of claim 32 wherein the device layer comprises a conductive layer.

34. The method of claim 33 wherein the pattern is produced by protrusions on a surface of the stamp, the pattern is used to form lower electrodes on the substrate.

35. The method of claim 34 wherein the protrusions comprise a height greater than a thickness of the device layer to pattern the device layer.

36. The method of claim 35 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

37. The method of claim 36 further comprises processing to form OLED pixels comprising:

forming at least one organic functional layer on lower electrodes; and

forming upper electrodes on the organic functional layer, wherein OLED pixels are formed where upper and lower electrodes sandwich the organic functional layer.

38. The method of claim 1 wherein the substrate comprises a polymeric substrate.

39. The method of claim 38 wherein the pattern is produced by protrusions on a surface of the stamp.

40. The method of claim 39 wherein the protrusions comprise a height greater than a thickness of the device layer.

41. The method of claim 40 wherein the height of the protrusions is at least about 5-10 times greater than the thickness of the device layer.

42. The method of claim 41 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

43. The method of claim 42 wherein the load comprises a net pressure of greater than about 1.1 times a yield strength of the substrate.

44. The method of claim 43 further comprises processing to form the device.

45. The method of claim 44 wherein the device comprises a device selected from the group consisting of an electrical device, a mechanical device, a

electromechanical device, and a microelectromechanical system.

46. The method of claim 40 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

47. The method of claim 46 further comprises processing to form the device.

48. The method of claim 47 wherein the device comprises a device selected from the group consisting of an electrical device, a mechanical device, a electromechanical device, and a microelectromechanical system.

49. The method of claim 1 wherein the substrate comprises a material selected from the group consisting of polyester, poly(ethylene terephthalate), poly(butylene terephthalate), poly(enthylene naphthalate), polyethylenesterephtalate, polycarbonate, polyimides, polysulfones, poly(*p*-phenylene ether sulfone), polyethylene, polypropylene, poly(vinyl

chloride), polystyrene, and poly(methyl methyleacrylate).

50. The method of claim 49 wherein the pattern is produced by protrusions on a surface of the stamp.

51. The method of claim 50 wherein the protrusions comprise a height greater than a thickness of the device layer to pattern the device layer.

52. The method of claim 51 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

53. The method of claim 52 further comprises processing to form the device.

54. A method of patterning comprising:

rotating a stamp comprising a drum with a pattern; and

translating a substrate with a device layer thereon as the stamp is rotated to pattern the device.

55. The method of claim 1 wherein the substrate comprises a polymeric substrate.

56. The method of claim 55 wherein the pattern is produced by protrusions on a surface of the stamp.

57. The method of claim 56 wherein the protrusions comprise a height greater than a thickness of the device layer to pattern the device layer.

58. The method of claim 57 wherein the stamp is pressed against the substrate surface under a load without causing the device layer to crack in non-patterned areas.

59. The method of claim 58 further comprises processing to form the device.

60. The method of claim 59 wherein the device comprises a device selected from the group consisting of an electrical device, a mechanical device, a electromechanical device, and a microelectromechanical system.

61. The method of claim 59 wherein the device comprises an OLED device.

Abstract

A method of fabricating a device comprising mechanically patterning a device layer using a stamp containing the desired pattern. The device layer is formed on a plastic or polymeric substrate. The stamp is pressed against the substrate under a load which patterns the device layer without cracking it in the non-patterned areas.

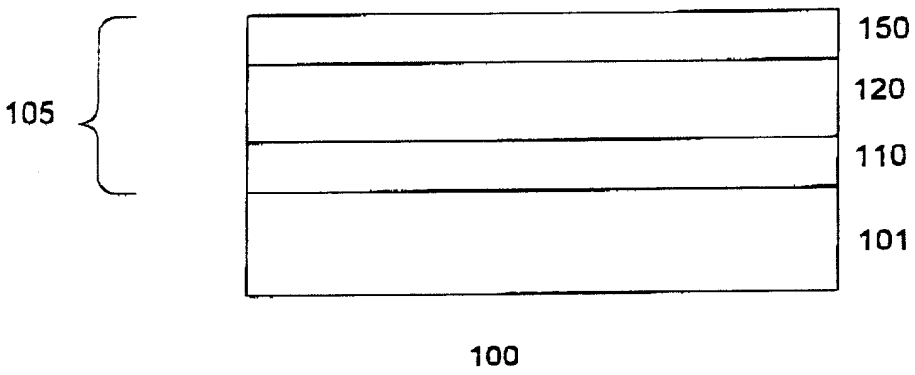

Fig. 1

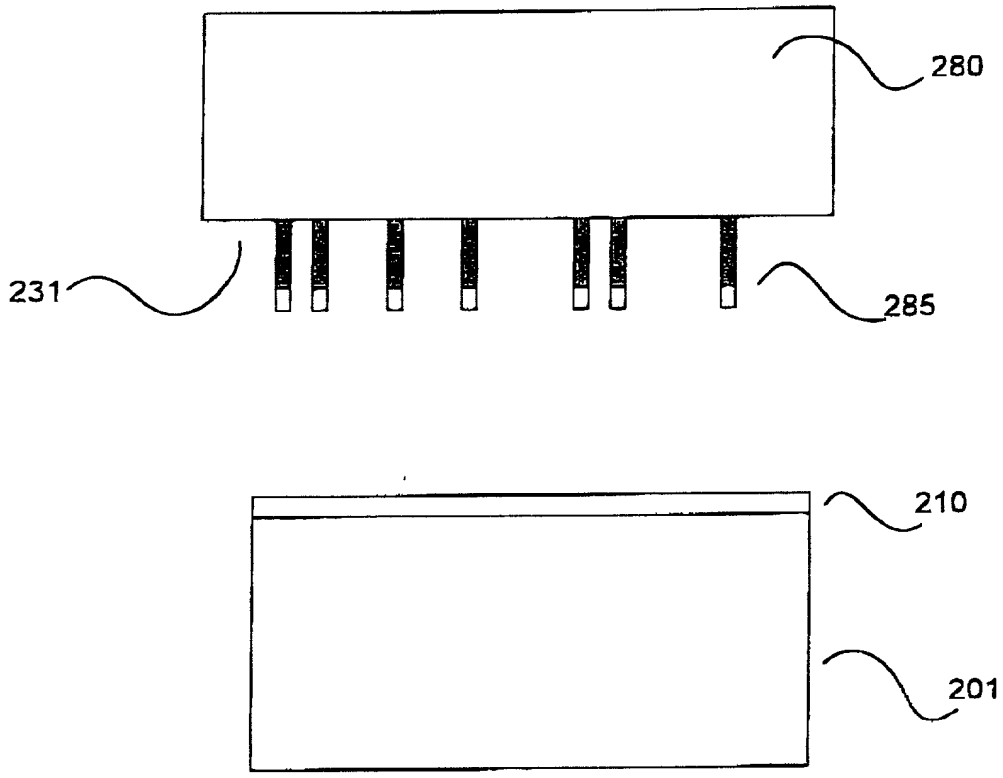

Fig. 2

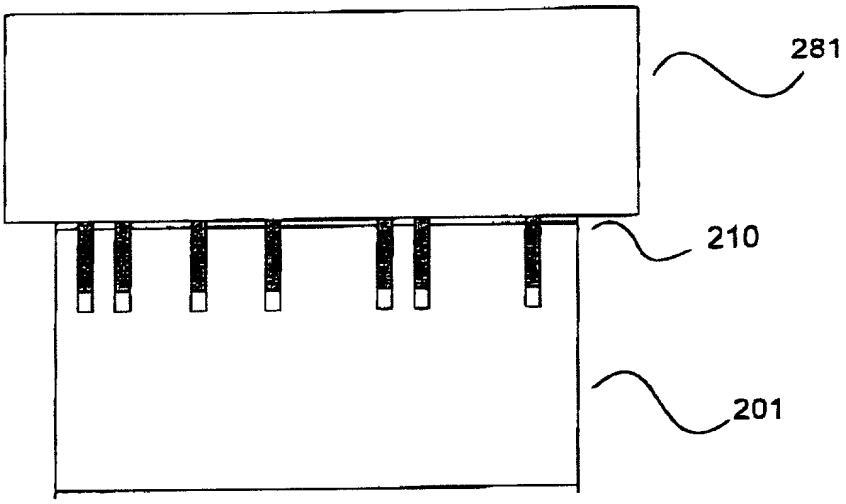

Fig. 3

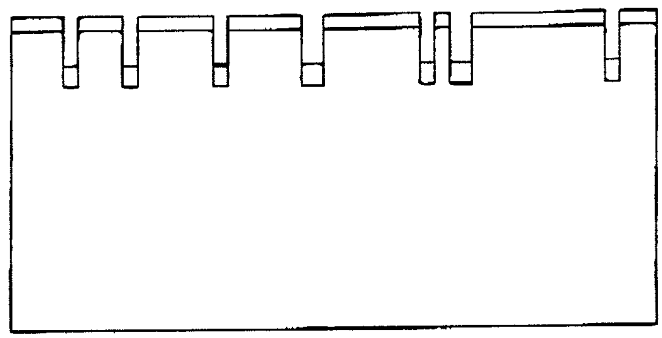

Fig. 4

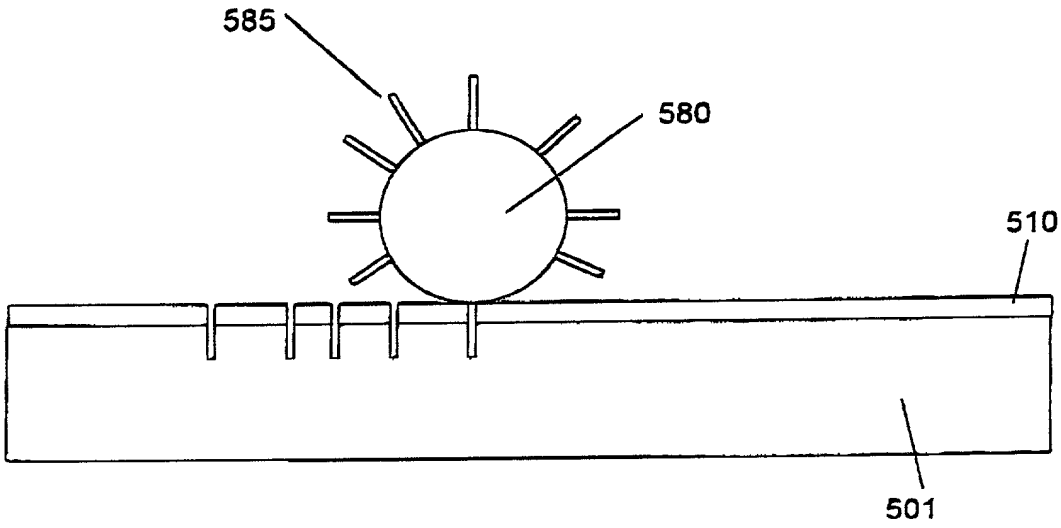

Fig. 5

Attorney's Docket No.: 12406-014001
Client's Ref. No.: 1999P8116US E/GS

COMBINED DECLARATION AND POWER OF ATTORNEY

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled MECHANICAL PATTERNING OF A DEVICE LAYER, the specification of which:

[] is attached hereto.
[X] was filed on March 9, 2001 as Application Serial No. _____.
[X] was described and claimed in PCT International Application No. PCT/SG 99/00074, filed on July 9, 2001.

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

Country	Application No.	Filing Date	Priority Claimed
PCT	PCT/SG 99/00074	9 July 1999	[X] Yes [] No

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Attorney's Docket No.: 12406-014001
Client's Ref. No.: 1999PB116US E/GS

Combined Declaration and Power of Attorney

1 - 02

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50040514.doc

Attorney's Docket No.: 12406-014001
Client's Ref. No.: 1999P8116US E/GS

Combined Declaration and Power of Attorney

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